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Magnetic properties of the covalent chain antiferromagnet RbFeSe2

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Abstract

© 2016 American Physical Society.Single crystals of the ternary iron selenide RbFeSe2 have been investigated by means of x-ray diffraction, magnetic susceptibility, magnetization, and specific-heat measurements as well as by Mössbauer spectroscopy. Built up from linear chains of edge-sharing FeSe4 tetrahedra, RbFeSe2 represents a quasi-one-dimensional antiferromagnet. Below TN=248 K three-dimensional antiferromagnetic collinear magnetic order sets in, with the magnetic moments oriented perpendicularly to the chain direction. The hyperfine fields determined from our Mössbauer studies reveal strongly reduced magnetic moments. The high-temperature susceptibility data of RbFeSe2 suggest a one-dimensional metallic character along the chains.

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